EXHIBIT 1

REPORT

Evaluate Two High Performance Engines
Wessinger
Ms. Lucy Webster
Location Not Applicable To File

June 13, 2011

Report To:	McGowan Hood & Felder Columbia, South Carolina McGH&F File Number: 02-11-0062
Attention:	Ms. Susan F. Campbell, Esquire
Engineer-in-Charge:	James I. Middleton, Jr., M.E., P.E.
ED&T File Number:	COL15183-57153

ENGINEERING DESIGN & TESTING Corp.
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June 13, 2011

SOUTH CAROLINA ENGINEERING DESIGN & TESTING CORPORATION No. C00642 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL REGISTERED ENGINEER No. 18911 JAMES I. MIDDLETON, JR.

6/13/11

REPORT TO: Ms. Susan F. Campbell, Esquire
McGowan Hood & Felder
1517 Hampton Street
Columbia, South Carolina 29201

REPORT FROM: James I. Middleton, Jr., M.E., P.E.

REFERENCE: Evaluate Two High Performance Engines
Client: Wessinger
McGowan Hood & Felder File Number: 02-11-0062
ED&T File Number: COL15183-57153

The following is a report concerning an investigation of two high performance engines that were assembled by Tyler Crockett Marine Engines. The purpose of this investigation has been to evaluate the mechanical condition of the two engines to determine whether the quoted work was completed.

The conclusions and opinions stated herein are based on information available to the examination as of this writing. It is conceivable that additional information may be forthcoming which bears on these conclusions and opinions. Therefore, the right is reserved to review and modify all conclusions and opinions at any future point in time should, in fact, additional information become available.

For convenience in presentation, this report is divided into sections as follows:

A. BACKGROUND INFORMATION AND WORK OF INVESTIGATION

The two high performance engines were assembled by Tyler Crockett Marine Engines (Crockett) in Ruby, Michigan for use on a boat owned by Howard Wessinger. The engines were identified as #377R and #378R and of similar construction. Both engines were nominally 615 cubic inches in capacity, eight cylinders, and supercharged. It was stated by Mr. Wessinger that within the first 17 hours of operation the engines exhibited signs of improper operation. The two engines were sent back to Crockett and additional work was reportedly performed, which included replacing 10 pistons (out of 16 total), intake and exhaust valves, oil and filters, cleaning of all parts, and honing of the cylinder walls. Subsequent to the return of the engines to Mr. Wessinger from Crockett, the engines were taken to MER Performance Marine (MER) in Little River, South Carolina for inspection and testing on a dynamometer. A dynamometer is a device used to perform operational testing of an engine, along with measuring the power output throughout the operating range of the engine in revolutions per minute. MER is owned and operated by Mark Rinda.

According to notes collected from Mr. Rinda, prior to placing either of the engines on the dynamometer, it was observed that #377R exhibited an oil leak. Further, as #377R was being prepared for placement on the dynamometer, which involved the removal of the flywheel, it was observed that the flywheel and flywheel bolts exhibited galling damage. It was also observed that there was no assembly lube present on the flywheel bolts and that oil was present on the outside of the block. Subsequent to the preparation to test #377R, the initial test on the dynamometer was conducted. During the initial test, oil was observed to be leaking from the mating surface of the intake manifold and the engine block and also from one of the crankcase breather vents installed on the valve covers. The initial test was concluded.

The location of the leaking crankcase breather vent was moved to a previously plugged hole on the valve cover in preparation for a second dynamometer test. During the second dynamometer test, Mr. Rinda observed a change in the audible tone of the engine that indicated a condition known as valve float. Valve float occurs when the valve spring tension is not adequate to keep the valve seated as required for proper operation of the engine. The second test was concluded. Mr. Rinda tested the tension on the springs and determined that the measured values of tension were inadequate. In an effort to continue the testing, Mr. Rinda installed shims to increase the tension on the valve springs that were found to be inadequate. A third dynamometer test was conducted. During the test it was observed that smoke was emanating from both of the valve covers. Subsequent to the observation of the smoke the engine speed was slowed to an idle. Mr. Rinda heard an audible engine knock emanating from the oil pan. An engine knock is a condition where metal to metal contact is made involving components of the rotating assembly of the engine, including the piston connecting rods and crank. Subsequent to hearing the engine knock the third test was stopped. Engine #377R was then disassembled for inspection. Engine #378R was not operated by Mr. Rinda. It was disassembled as it was received from Mr. Wessinger and Crockett.

The work of the investigation included the examination of the condition, including damage, to both of the previously disassembled engines. The observed conditions of engines were documented by photographs. The investigation collected files from Mr. Rinda, which included notes, dimensions and tolerances measured on various engine components, and results from the MER dynamometer testing. Further, the investigation obtained copies of invoices from Crockett for work, including parts and labor, performed on the two engines and charged to Mr. Wessinger. This documentation was used to determine whether the invoiced work performed was consistent with the condition of the engines as observed.

B. OBSERVATIONS

1. Engine #377R

The overall condition of the engine block from this engine is shown in figures A1-A3. The mechanical conditions of the engine components were examined. This included an examination of the engine block, cylinder walls, cylinder heads, intake and exhausts valves, piston heads, piston connecting rods, piston pins, piston rings, crankshaft, the associated bearings and bushings, valve covers, and oil pan. Longitudinal scratches where observed on some cylinder walls as shown in example in Figures A4-A5. Some of the connecting rod bearings exhibited signs of severe metal to metal contact and a degradation of the lubricating oil film between the bearings and the crankshaft as shown in example in Figures A6-A7. Some of the main bearings exhibited severe degradation damage and others less severe damage from metal to metal contact and discoloration from excessive heat as shown in example in Figures A8-A9. Some of the piston pin bushings installed in the connected rods exhibited discoloration that was indicative of excessive heat in the area as shown in example in Figures A10-A11. The oil pan was damaged in the form of deformation to the bottom of the pan and metal shavings were also observed at the bottom of the pan as shown in Figure A12.

The cylinder heads were examined and there was no observable damage to either set as shown in example in Figures A13-A14. The intake and exhaust valves were examined and it was observed that some of the intake valves had carbonized build up adhered to the surfaces as shown in example in Figure A15. The valve covers were examined, in particular, the locations of the crankcase breather vents. It was observed that a baffle was welded to the inside of the valve covers, which impeded the crankcase breather vents from being fully open as shown in example in Figures A-16-A17. The valve covers were not labeled by MER, so it

was not known by this investigation which valve covers were originally installed on either engine, however, the valve covers were of typical arrangement to each other. The crankshaft was examined and exhibited scratch marks around the circumference of several crankpin journals that indicated movement of the associated bearing as shown in example Figure A18.

Lastly the oil pump and oil pickup tube were examined. It was observed that the pickup tube was not seam welded around the entire interface with the oil pump housing as is shown in Figures A19-A20. A sample of oil as collected by Mr. Rinda was examined and retained by this investigation. It was visually observed that the oil sample was of normal viscosity; however, the color was dark as is shown in Figure A21.

A test was conducted to evaluate whether the construction of the oil pump and pickup tube assembly was such that it would allow air to become entrained in the oil during the operation of the oil pump. A test apparatus was developed that functioned to seal the inlet side of the pickup tube. An air compressor was used to then supply air at a pressure of 20 pounds per square inch into the oil pump through the discharge port. The compressor nozzle was constructed with a rubber tip that would make a seal against the discharge port. A soapy liquid was applied to several surfaces of the oil pump and pickup tube assembly. The formation of bubbles was observed at the seal between the oil pump housing and the pump input shaft along with the mating surfaces of the oil pump housing and the pickup tube as shown in Figures C1-C2. The formation of bubbles indicated that the oil pump was not sealed against air entrainment.

2. Engine #378R

The overall condition of the engine block is shown in Figures B1-B3. The mechanical conditions of the engine components were examined. These included an examination of the engine block, cylinder walls, cylinder heads, intake and exhaust valves, piston heads, piston connecting rods, piston pins, piston rings, crankshaft, the associated bearings and bushings, valve covers, and oil pan. The cross-hatch patterns from honing of the cylinder walls, as shown in example in Figures B4-B5, were not consistent with a recent honing as it would be expected that they would have been more pronounced. Some of the connecting rod bearings exhibited signs of metal to metal contact and a degradation of the lubricating oil film between the bearings and the crankshaft as shown in example in Figures B6-B7. The main bearings exhibited cosmetic grooves on the surfaces; however, there was no indication of metal to metal contact. The piston pin bushings installed in the connecting rods exhibited minimal discoloration that was indicative of limited exposure to excess heat as shown in example in Figure B8. The pistons were examined and it was observed that heavy deposits where present on the crowns as shown in example in Figures B9-B10. The oil pan was examined and a thick oil residue was found adhered to the sides of the pan and along the bottom as shown in Figure B11.

The cylinder heads were examined and there was no observable damage to either set as shown in example in Figures B12-B13. The intake and exhaust valves were examined and it was observed that some of the intake valves had carbonized build up adhered to the surfaces as shown in Figures B14-B15. The valve covers were examined, in particular, the locations of the crankcase breather vents. As with the other engine, a baffle was welded to the inside of the valve covers which impeded the crankcase breather vents as shown previously in the example in Figures 16A-17A. The crankshaft was examined and there was no observable damage that would otherwise indicate metal to metal contact.

Lastly, the oil pump and oil pickup tube were examined. It was observed that the pickup tube was not seam welded around the entire interface with the oil pump housing as is shown in Figures B16-B17. A sample of oil as collected by Mr. Rinda was examined and retained by this investigation. It was visually observed that the oil was of dark color and that the viscosity of the oil was higher than would be expected for the duration of time the engine was operated as is shown in Figure B18.

A test was conducted to evaluate whether the construction of the oil pump and pickup tube assembly was such that it would allow air to become entrained in the oil during the operation of the oil pump. A test apparatus was developed that functioned to seal the inlet side of the pickup tube. An air compressor was used to then supply air at a pressure of 20 pounds per square inch into the oil pump through the discharge port. The compressor nozzle was constructed with a rubber tip that would make a seal against the discharge port. A soapy liquid was applied to several surfaces of the oil pump and pickup tube assembly. The formation of bubbles was observed at the seal between the oil pump housing and the pump input shaft along with the mating surfaces of the oil pump housing and the pickup tube as shown in Figures C3-C4. The formation of bubbles indicated that the oil pump was not sealed against air entrainment.

C. DISCUSSION

1. Engine #377R

The damage to this engine was more severe than the damage observed on #378R. It was reported that this engine was operated on the dynamometer and exhibited signs of improper operation, which included oil leakage, indications of valve float, and engine knocking. Further, the examination determined that metal to metal contact had taken place at multiple locations in the engine. The damage that was observed on various bearing surfaces indicated that a proper oil film, meant to prohibit metal to metal contact, was not present. Further, the partial weld present on the oil pickup tube and the lack of an adequate interference fit between the pickup tube and the oil pump housing would allow air entrainment into the oil as a proper seal between the pump and pickup tube did not exist. Air entrainment into oil is known to result in the acceleration of oil degradation through oxidation. This takes place as the entrained air is compressed during the cycling of the engine and therefore heated. The heat and presence of oxygen in the air is sufficient to result in oxidation of the oil. In addition, air bubbles in the oil reduce its lubricity due to the fact that air is compressible. The lubricating qualities of oil present between some surface in the engine, such as between the piston rod bearings and the crankpin journals, depends on a property of oil in that it is incompressible. The oxidation of the oil and presence of air bubbles entrained in the oil would act to significantly reduce the lubrication properties of the oil and is consistent with the damage observed on multiple components within the engine. Further, a lack of a proper seal would be detrimental to the performance characteristics of the oil pump itself. Proper lubrication of the engine did not exist.

Given that the engine was operated on the dynamometer by MER to a point where severe damage resulted, the condition of the engine prior to being operated on the dynamometer is now known by this investigation. It should be noted that MER tested the engine within its expected normal range of operation as indicated by the MER dynamometer results.

Given the observations of damage to the engine components and the determination that proper lubrication did not exist, it was determined that the engine was not assembled to a standard of quality that would result in a reasonable service life.

2. Engine #378R

It was reported that this engine was not operated on the dynamometer by MER. The condition of the disassembled engine was as received by Mr. Wessinger. Similar to #377R, the examination determined that metal to metal contact had taken place at multiple locations in the engine. The damage that was observed on various bearing surfaces indicated that a proper oil film, meant to prohibit metal to metal contact, was not present. Further, the partial weld present on the oil pickup tube and the lack of an adequate interference fit between the pickup tube and the oil pump housing would allow air entrainment into the oil as a proper seal between the pump and pickup tube did not exist. The lack of a proper seal resulted in a reduction of the lubrication properties of the oil and a reduction of the oil pump capacity. Proper lubrication of the engine did not exist. It is therefore reasonable to conclude that premature wear of the engine components would have resulted had the engine been operated for any significant duration.

Consideration was given to the work that was invoiced to Mr. Wessinger by Crockett after the engines had been sent back as a result of improper operation. Among other items, it was reported that the oil and filters had been changed, along with honing the cylinder walls. The invoice also stated that the engine had been operated on a dynamometer. In examining the condition of the oil, it was visually observed that the viscosity of the oil was higher than would be expected should the oil have been changed and the engine operated just on the dynamometer. The dark color and viscosity indicated that oxidation of the oil took place. This determination was further indicated by the presence of thick oil residue adhered to the walls of the oil pan. It was therefore determined that the oil had not been changed when the engine was sent back to Crockett as reference by the March 12, 2011 invoice.

The cross-hatch patterns observed on the cylinder walls were not consistent with having been formed during the honing process just prior to being operated on the dynamometer at Crockett. The cross-hatch patterns would have been more pronounced and of a more reflective appearance in order to be consistent with a second recent honing process. It was therefore determined that the cylinder walls were not honed when the engine was sent back to Crockett as reference by the March 12, 2011 invoice.

Given the observations of damage to the engine components and the determination that proper lubrication did not exist, it was determined that the engine was not assembled to a standard of quality that would result in a reasonable service life.

D. CONCLUSIONS

1. Engine #377R

   a. Proper lubrication of the engine did not exist.

   b. The condition of the engine prior to being operated on the dynamometer is not known by this investigation. It should be noted that MER tested the engine within the normal range of operation as indicated by the MER dynamometer results.

   c. The engine was not assembled to a standard of quality that would result in a reasonable service life.

2. Engine #378R

   a. Proper lubrication of the engine did not exist.

   b. Premature wear of the engine components would have resulted had the engine been operated for an adequate duration.

   c. The oil had not been changed when the engine was sent back to Crockett as reference by the March 12, 2011 invoice.

   d. The cylinder walls were not honed when the engine was sent back to Crockett as reference by the March 12, 2011 invoice.

   e. The engine was not assembled to a standard of quality that would result in a reasonable service life.

FIGURES
Photographic Series A
Engine #377R

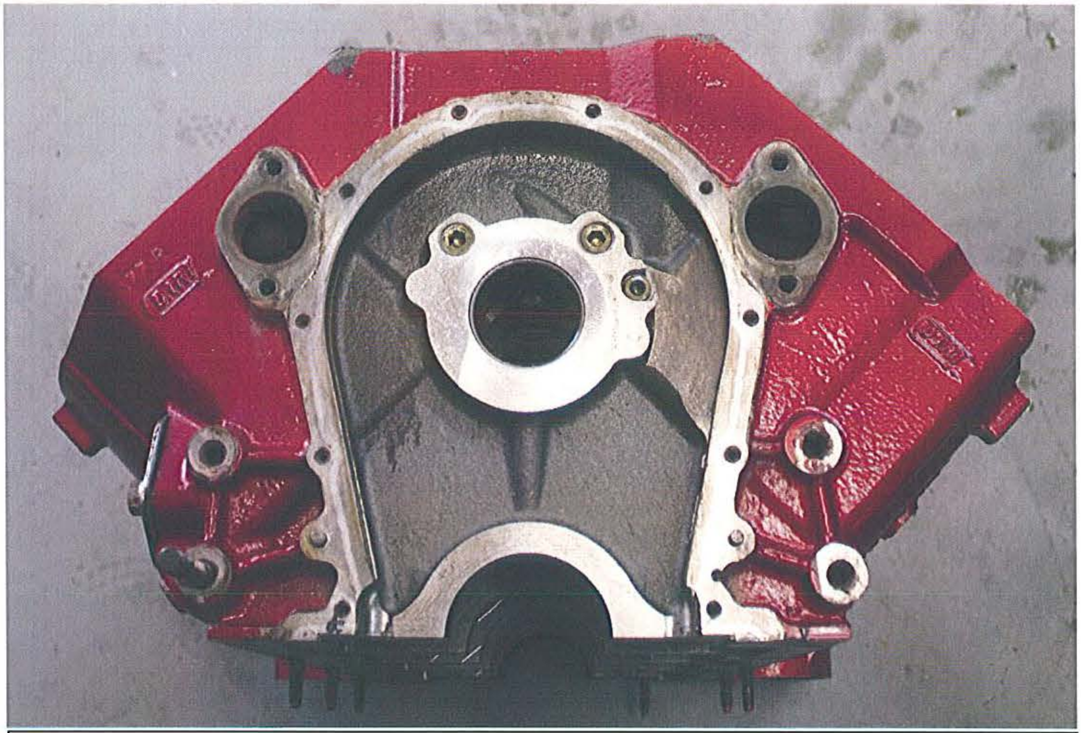

Figure A1 #377R: Front of block (image cropped)

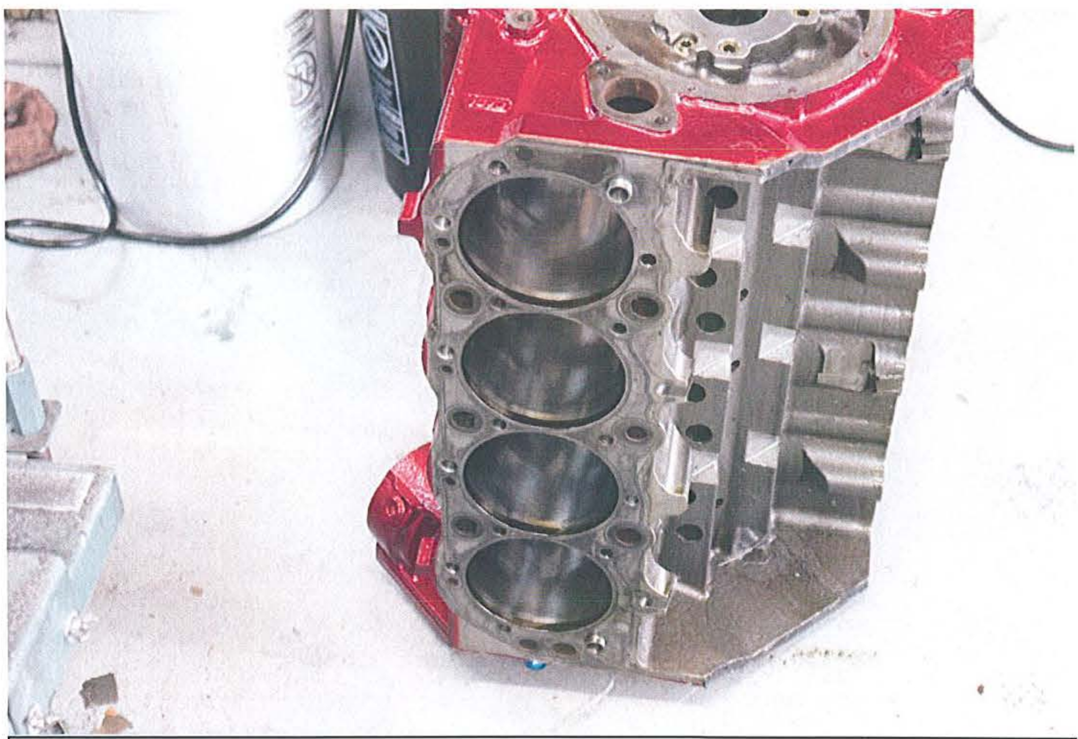

Figure A2 #377R: Cylinders 1,3,5, and 7

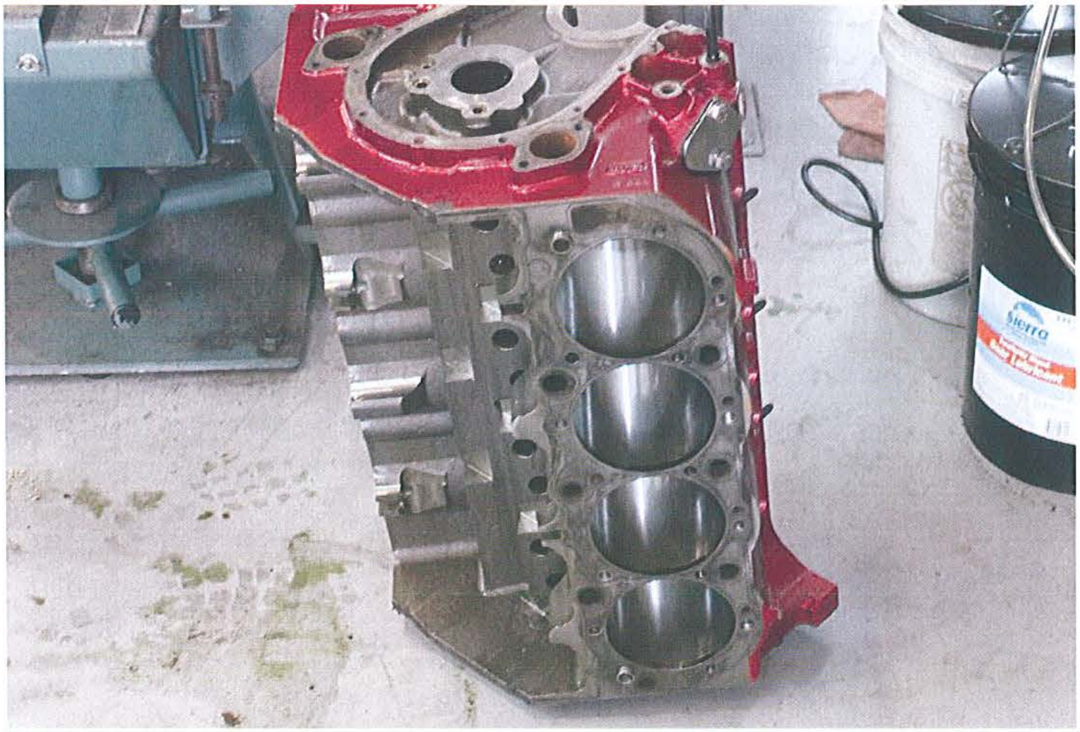

Figure A3 #377R: Cylinders 2,4,6, and 8 (image cropped)

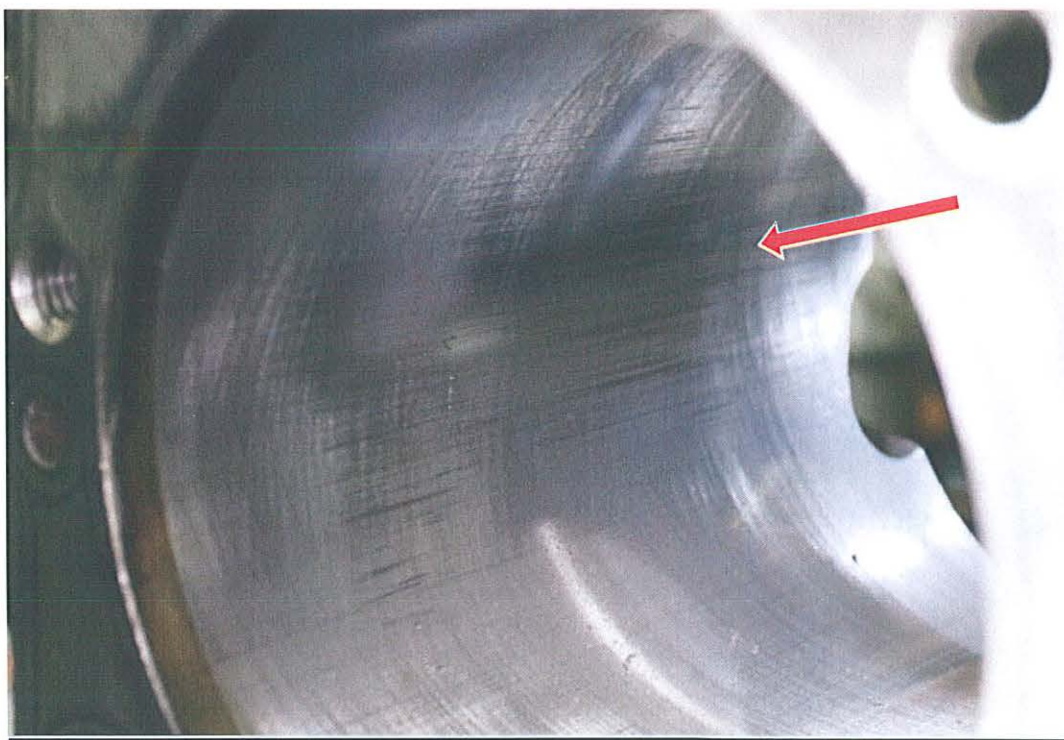

Figure A4 #377R: Lateral scratches on cylinder #3 wall, arrow indicates direction of scratching

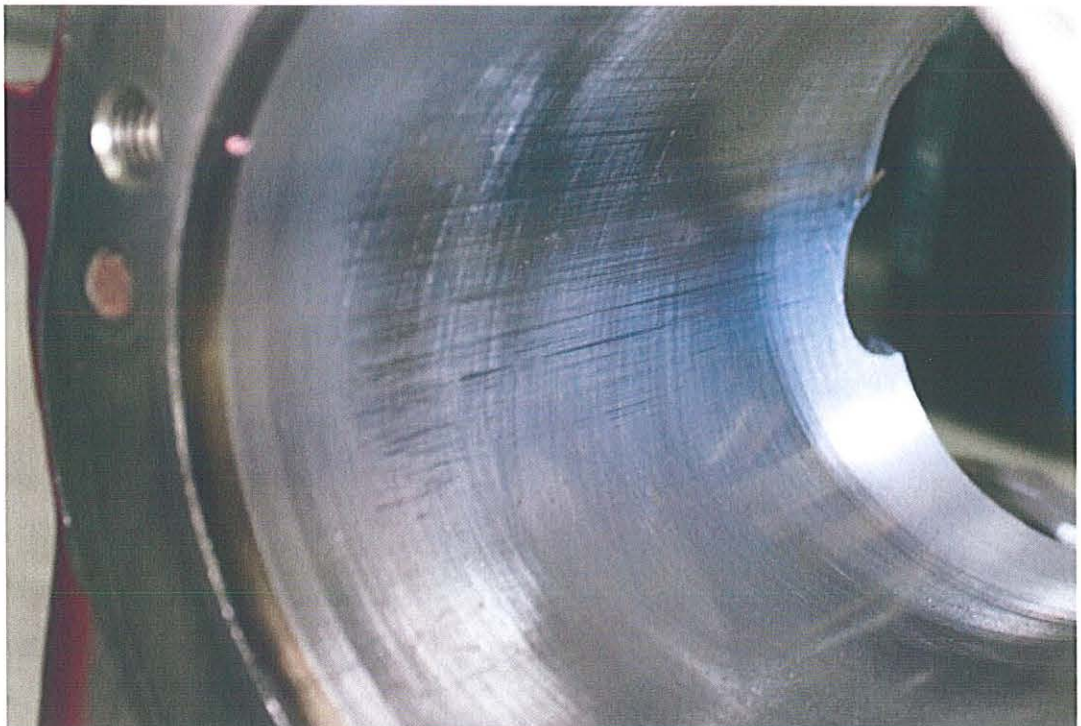

Figure A5 #377R: Lateral scratches on cylinder #7 wall, arrow indicates direction of scratching

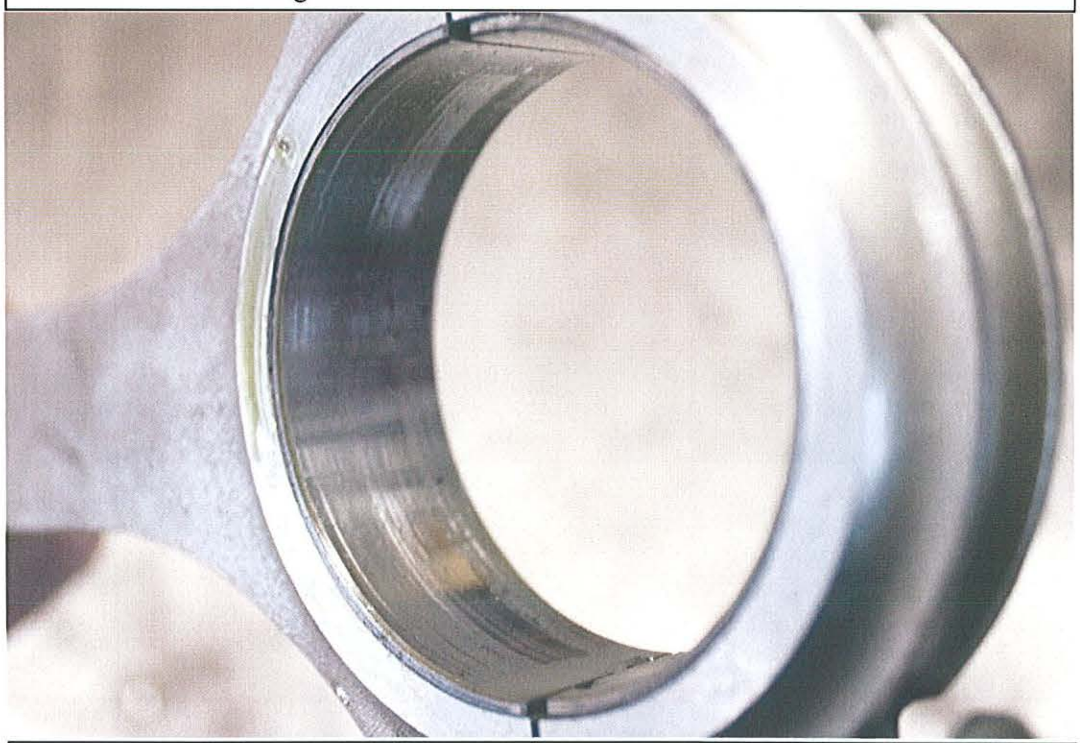

Figure A6 #377R: Indication of metal to metal contact on cylinder #3 connecting rod bearing (image cropped)

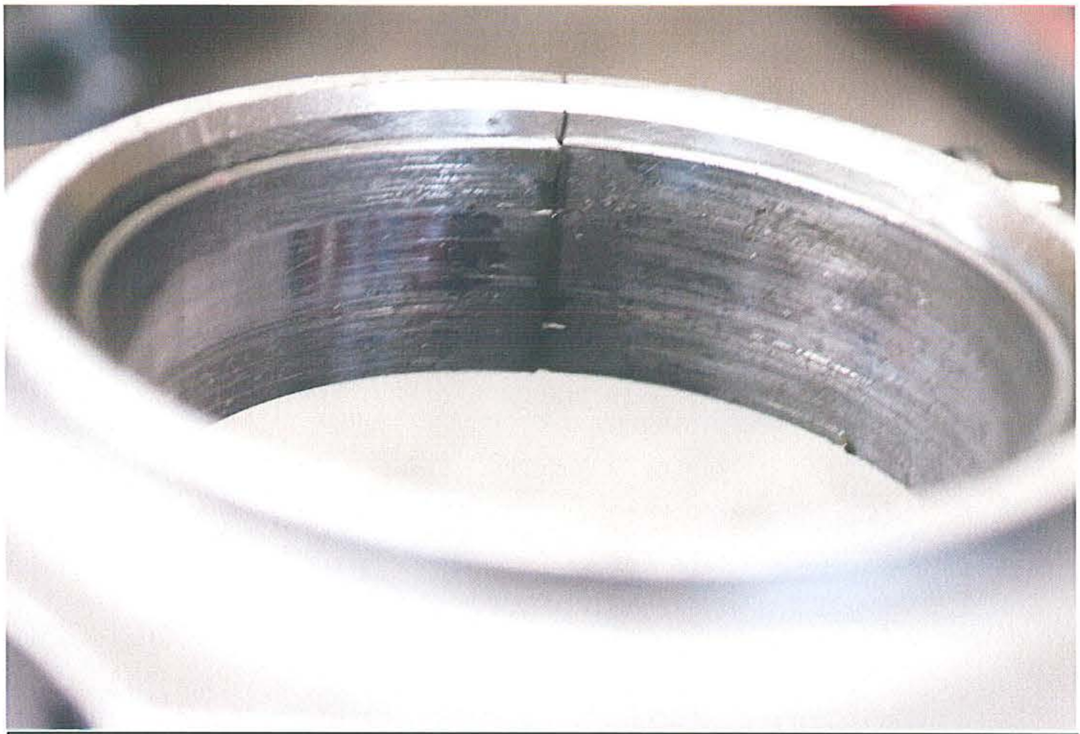

Figure A7 #377R: Indication of metal to metal contact on cylinder #2 connecting rod bearing (image cropped)

Figure A8 #377R: Severe damage to main bearing – unknown location on crankshaft (image cropped)

Figure A9 #377R: Severe damage to main bearing – unknown location on crankshaft (image cropped)

Figure A10 #377R: Damage to piston pin bushing cylinder #1 (image cropped)

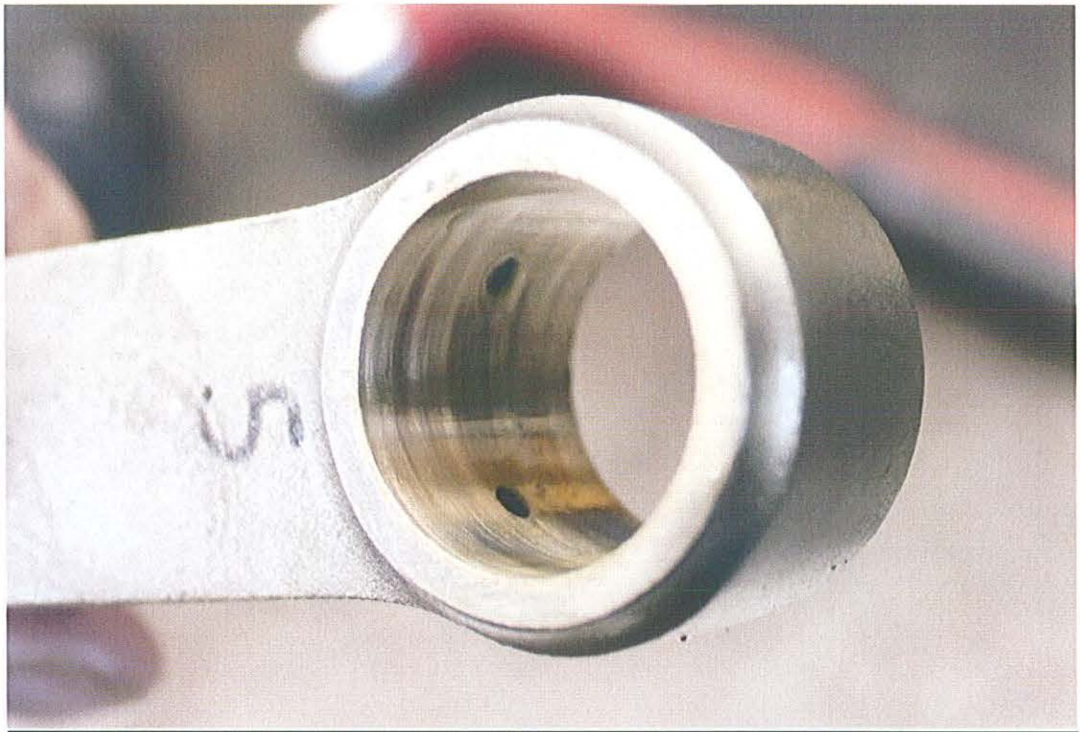

Figure A11 #377R: Damage to piston pin bushing cylinder #5 (image cropped)

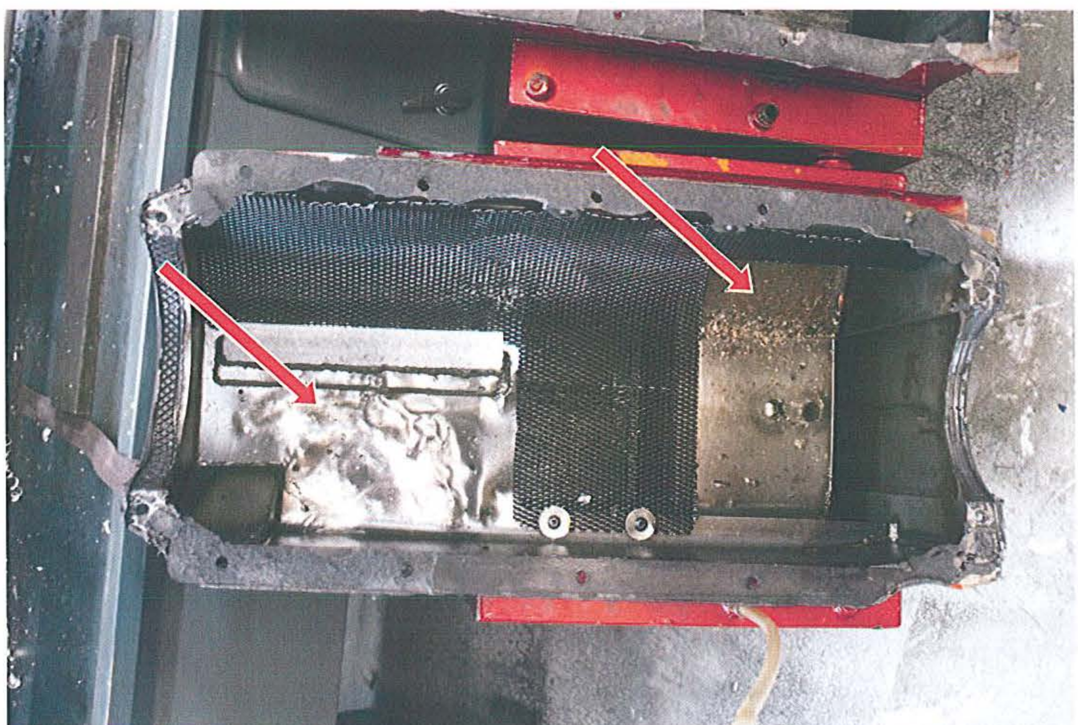

Figure A12 #377R: Deformation of oil pan and metal shavings in oil pan as shown by arrows

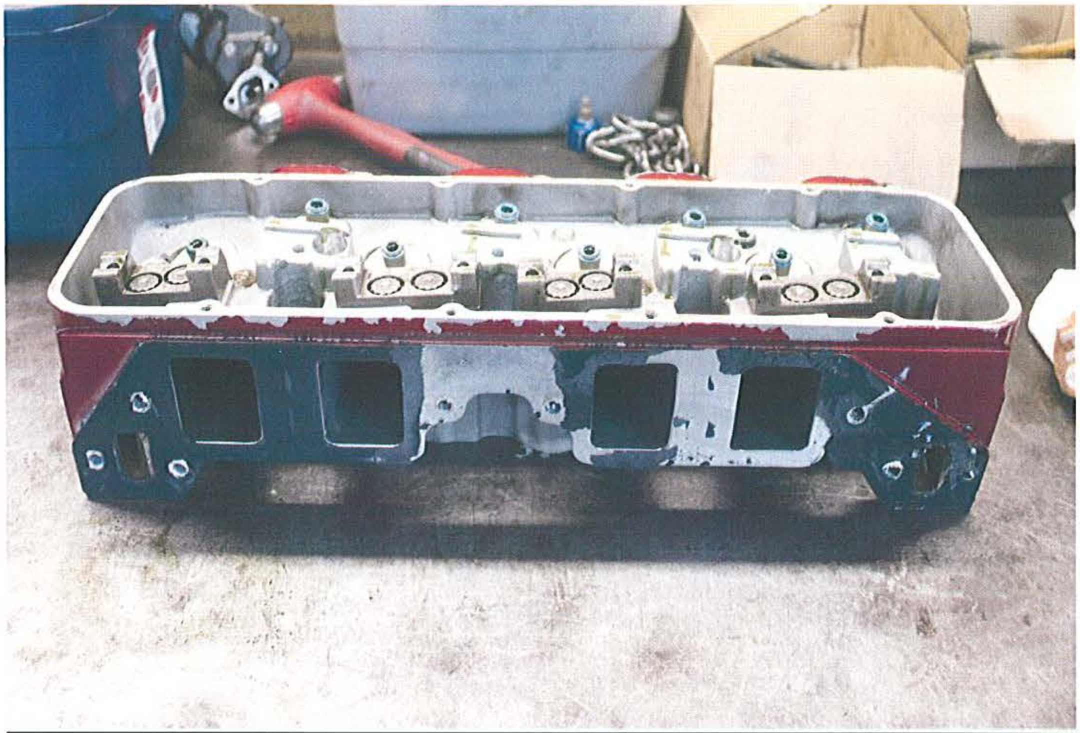

Figure A13 #377R: Cylinder head for cylinders 1,3,5, and 7 valve train side

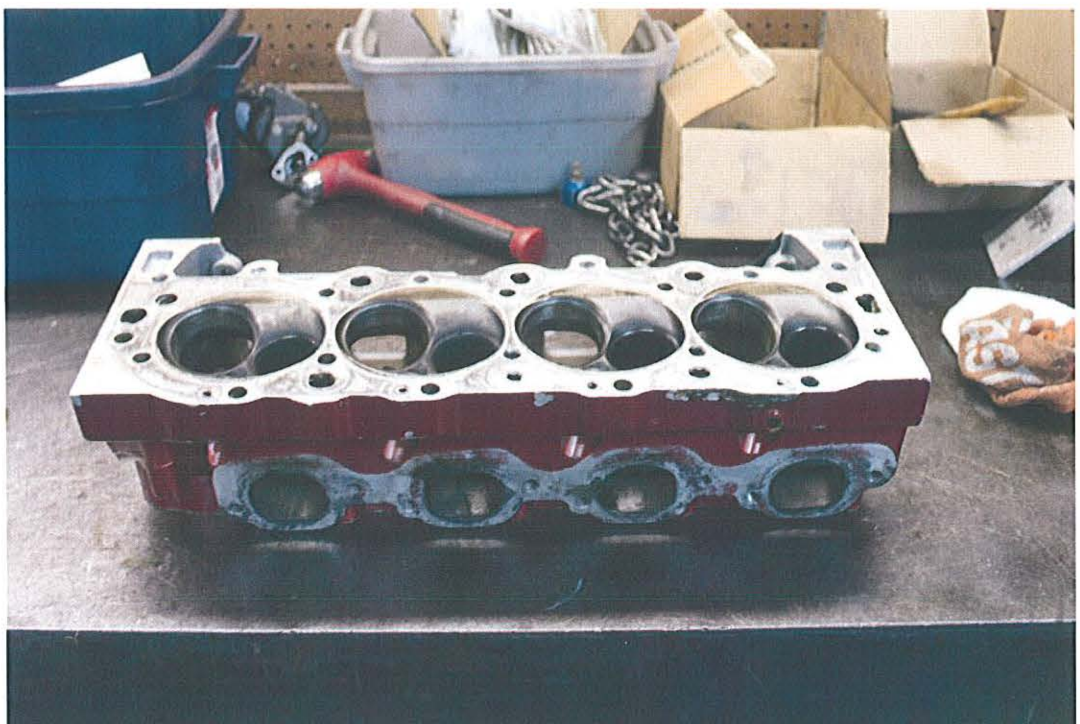

Figure A14 #377R: Cylinder head for cylinders 1,3,5, and 7 combustion chamber side

Figure A15 #377R: Carbonized buildup adhered to intake valve combustion side

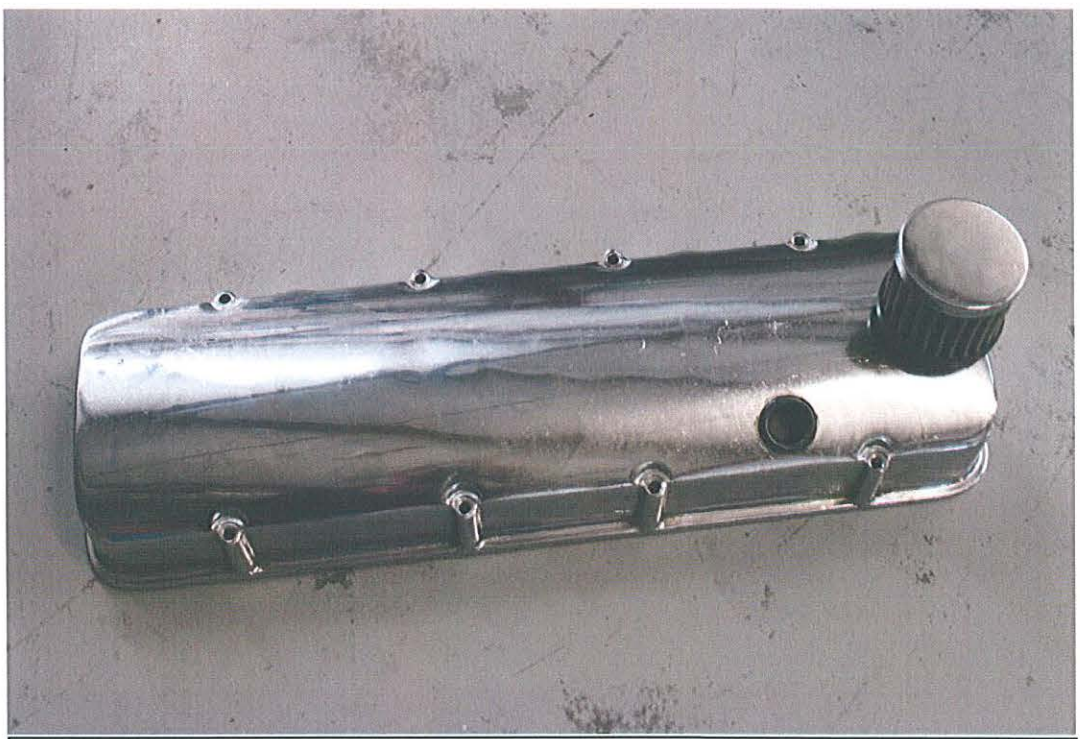

Figure A16 Typical valve cover top side with crankcase breather vent

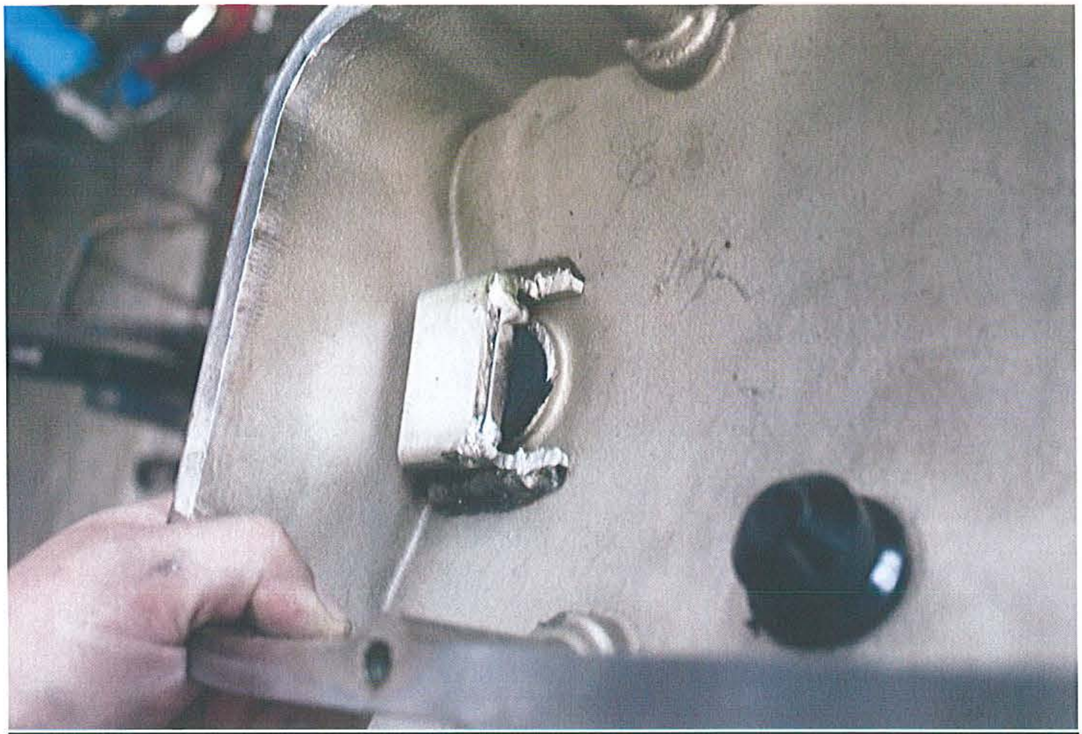

Figure A17 Typical valve cover engine side showing baffle impedance with vent

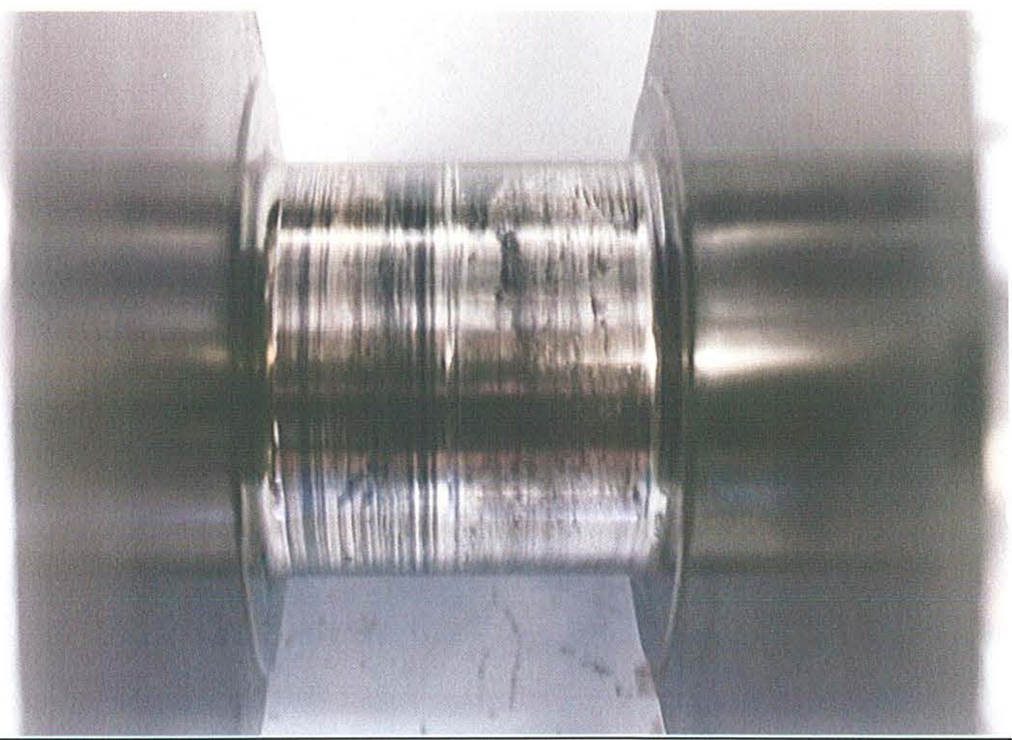

Figure A18 #377R: Crankpin journal scratches

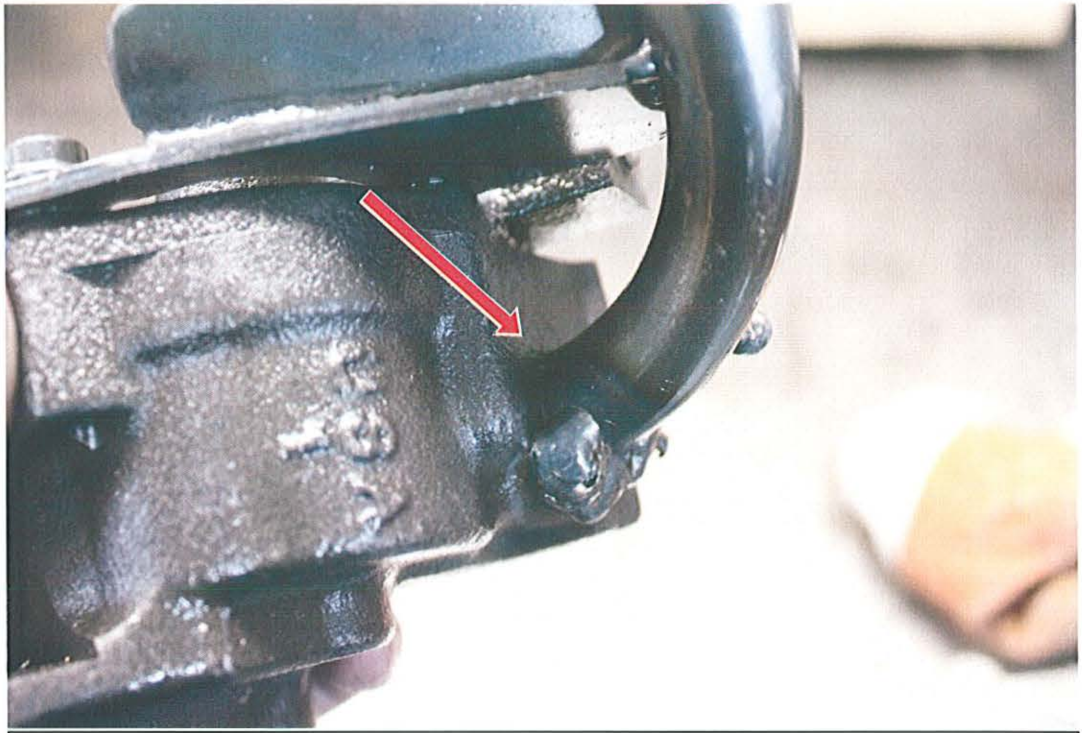

Figure A19 #377R: Oil pump and oil pump pickup tube partially welded interface

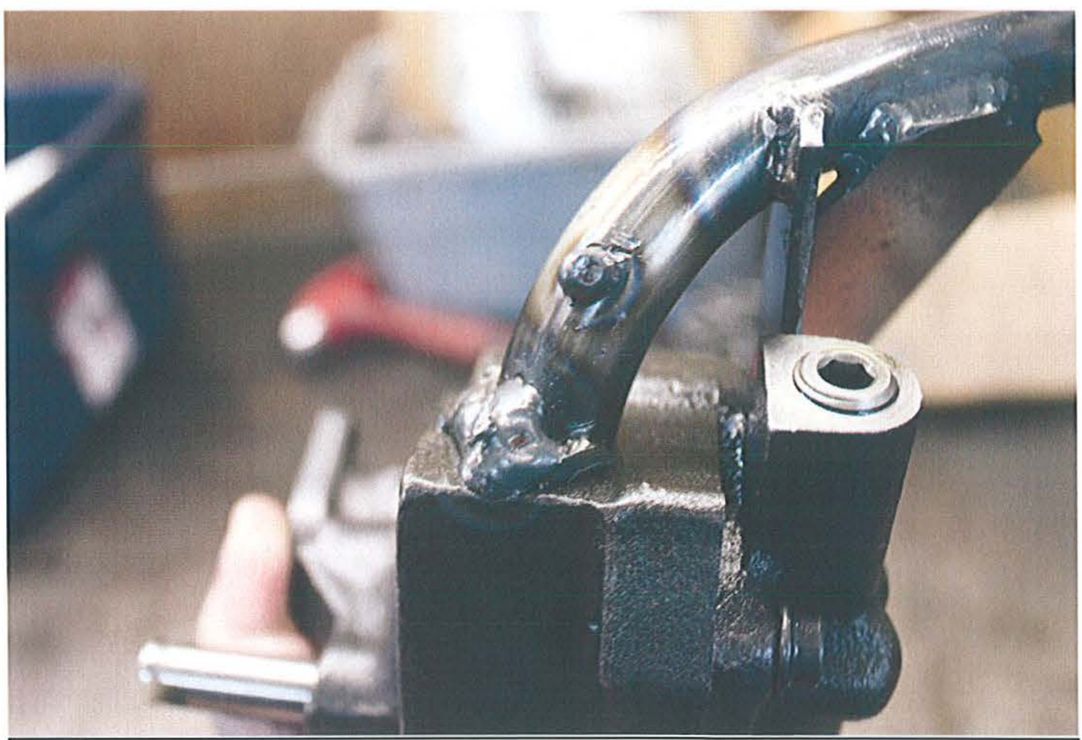

Figure A20 #377R: Oil pump and oil pump pickup tube partially welded interface

Figure A21 #377: Oil sample collected by MER

FIGURES
Photographic Series B
Engine #378R

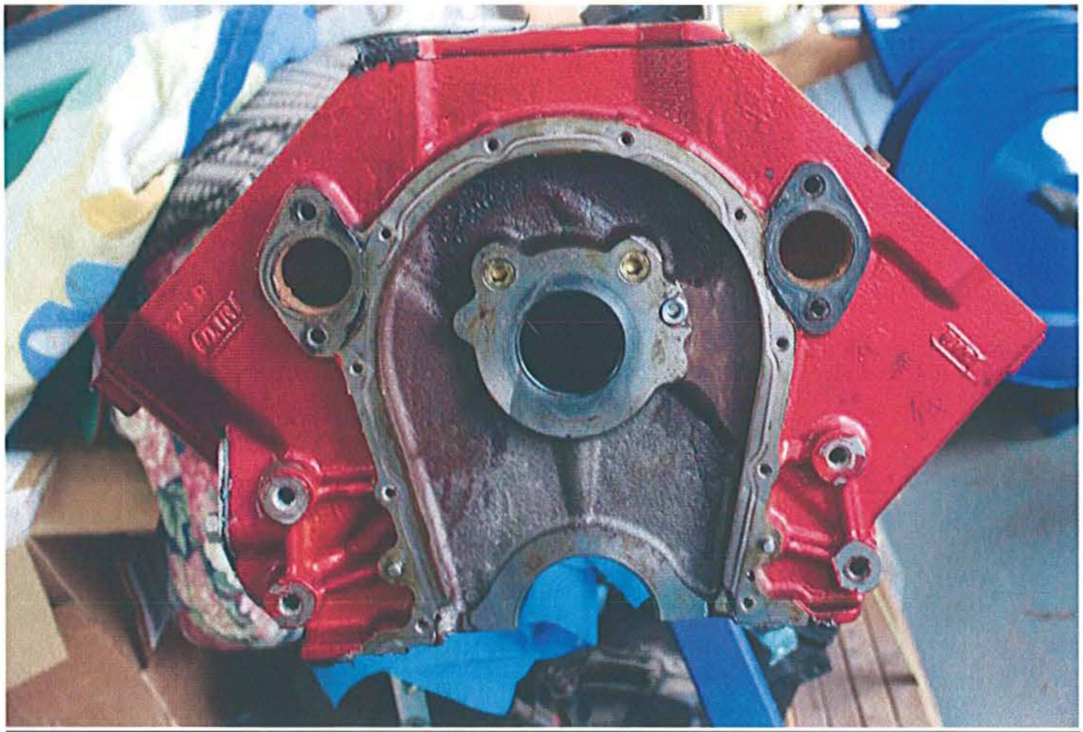

Figure B1 #378R: Front of block (image cropped)

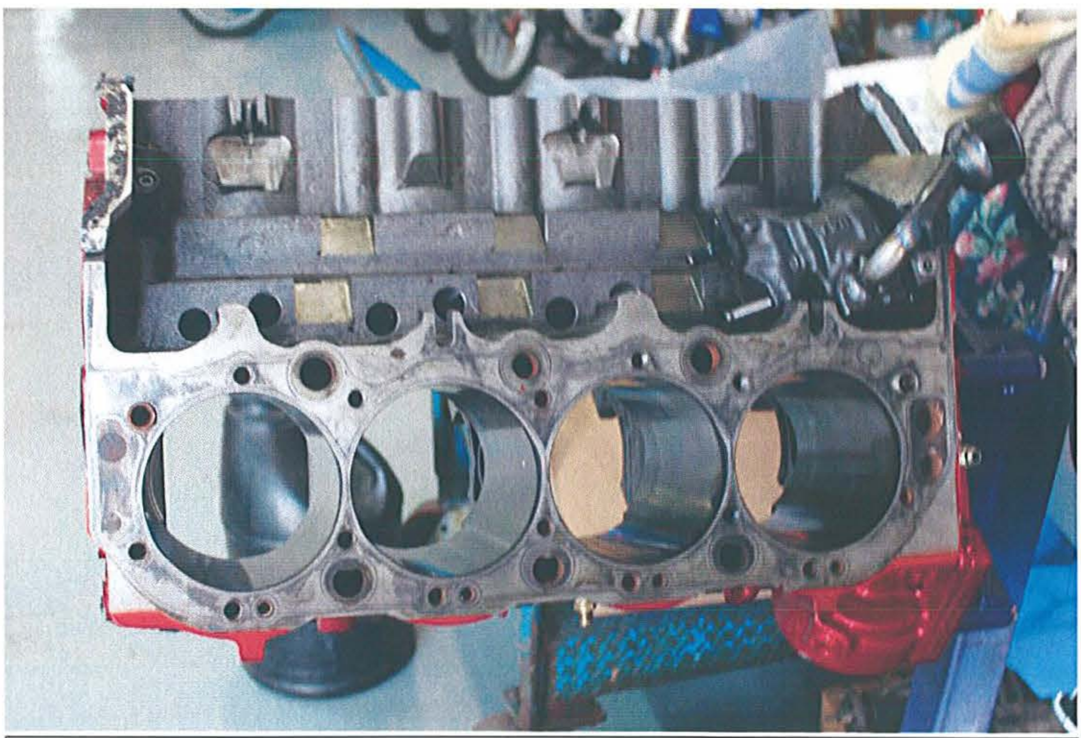

Figure B2 #378R: Cylinders 1,3,5, and 7 (image cropped)

Figure B3 #378R: Cylinders 2,4,6, and 8 (image cropped)

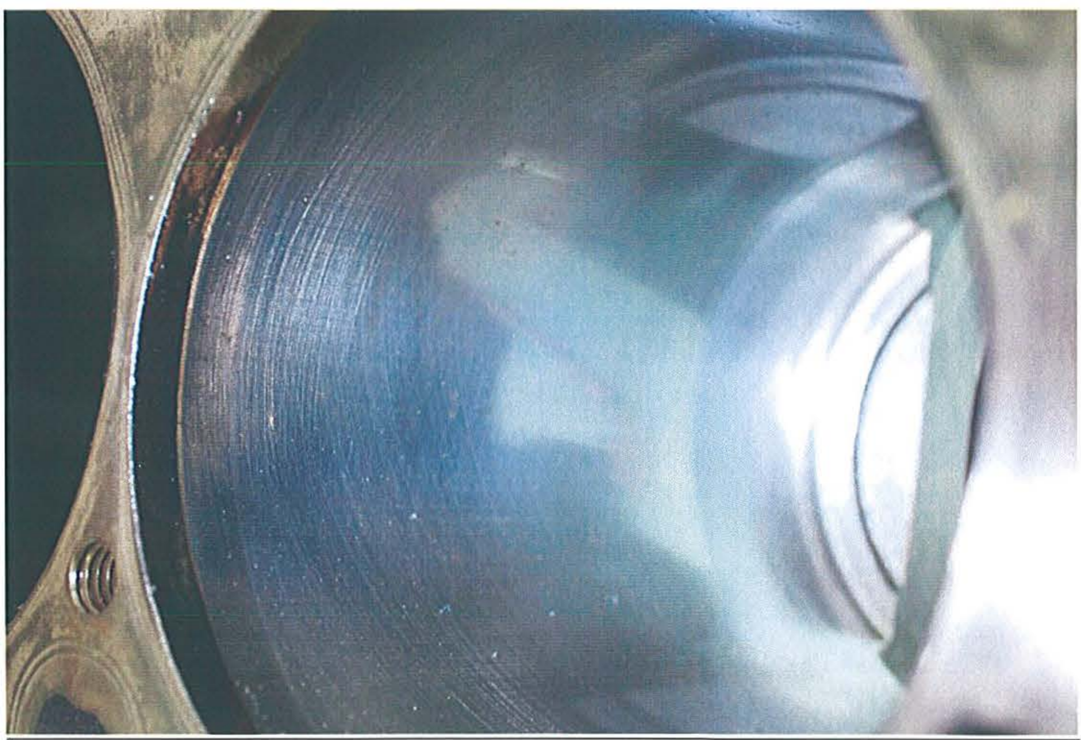

Figure B4 #378R: Cross-hatch patterns in cylinder #2 (image cropped)

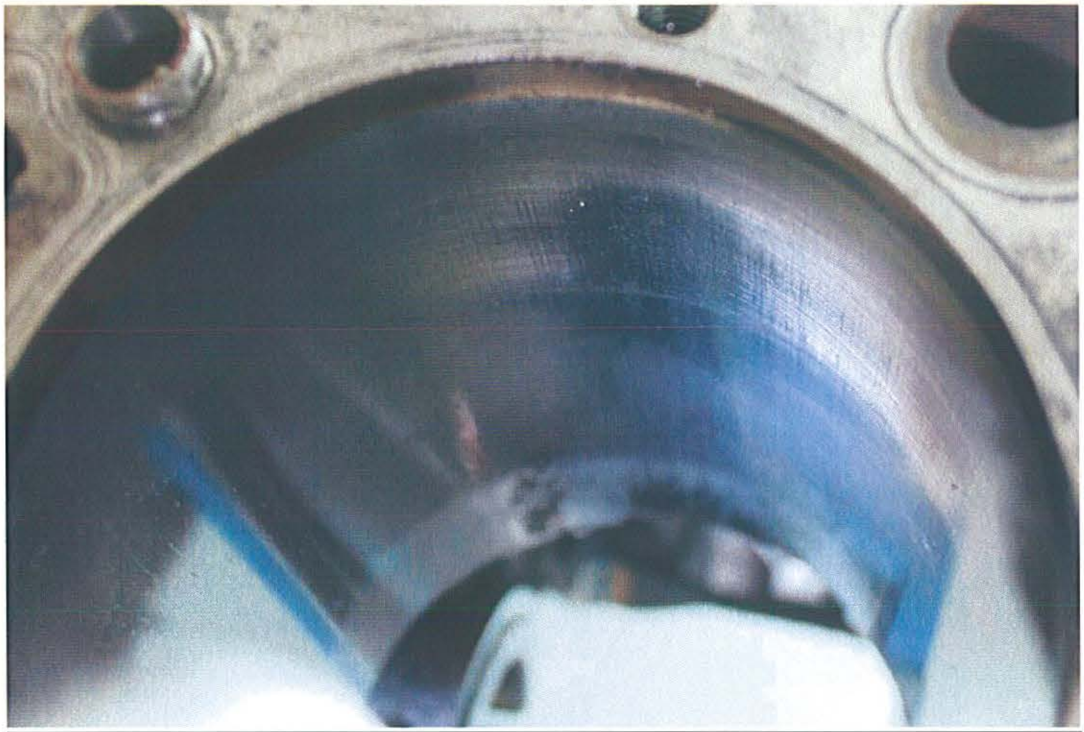

Figure B5 #378R: Cross-hatch patterns in cylinder #8 (image cropped)

Figure B6 #378R: Indication of metal to metal contact on cylinder #6 connecting rod bearing (image cropped)

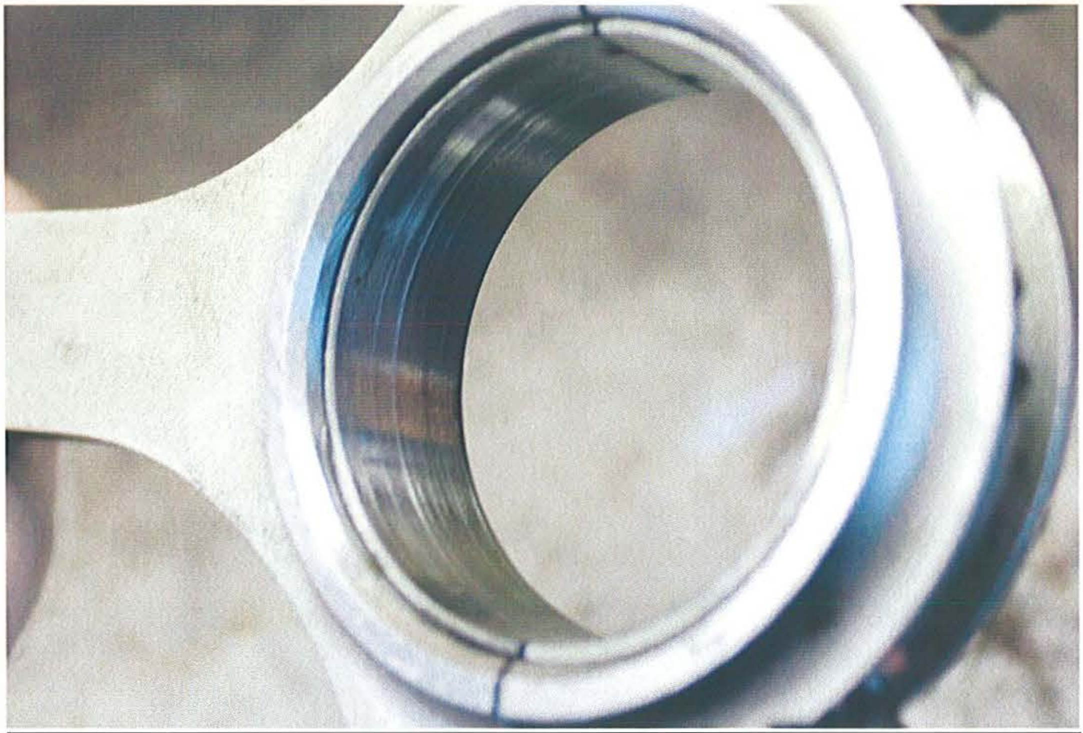

Figure B7 #378R: Indication of metal to metal contact on cylinder #2 connecting rod bearing (image cropped)

Figure B8 #378R: Minimal discoloration of piston pin bushing on cylinder #4 (image cropped)

Figure B9 #378R: Deposits on piston crown on cylinder #1 (image cropped)

Figure B10 #378R: Deposits on piston crown on cylinder #7 (image cropped)

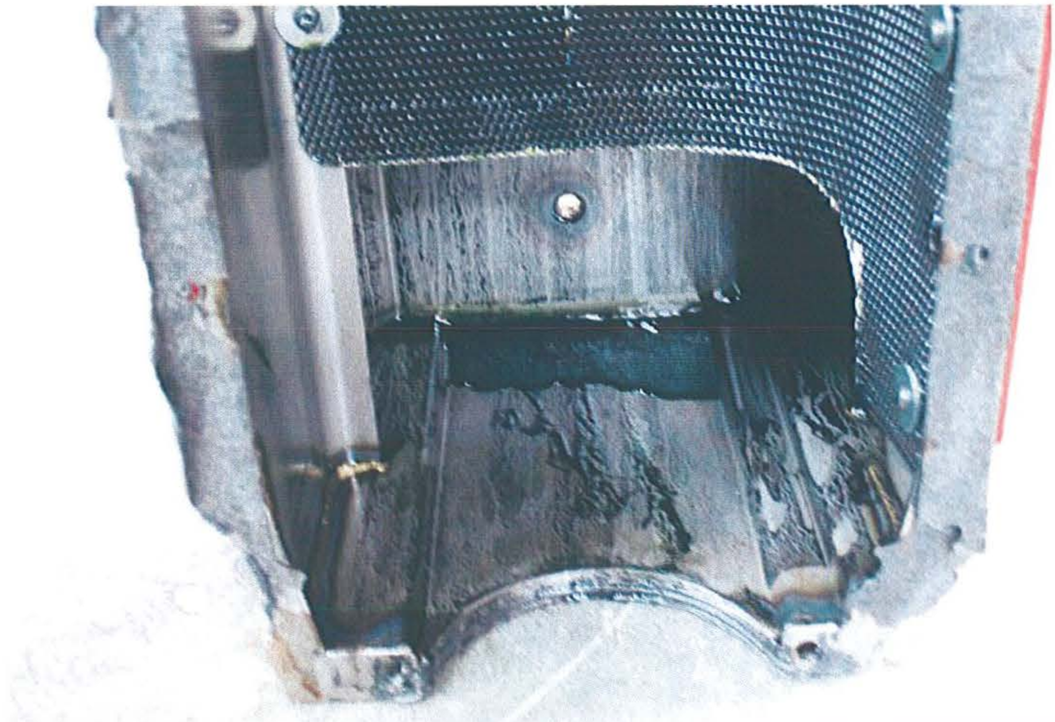

Figure B11 #378R: Thick oil residue found adhered to sides of oil pan

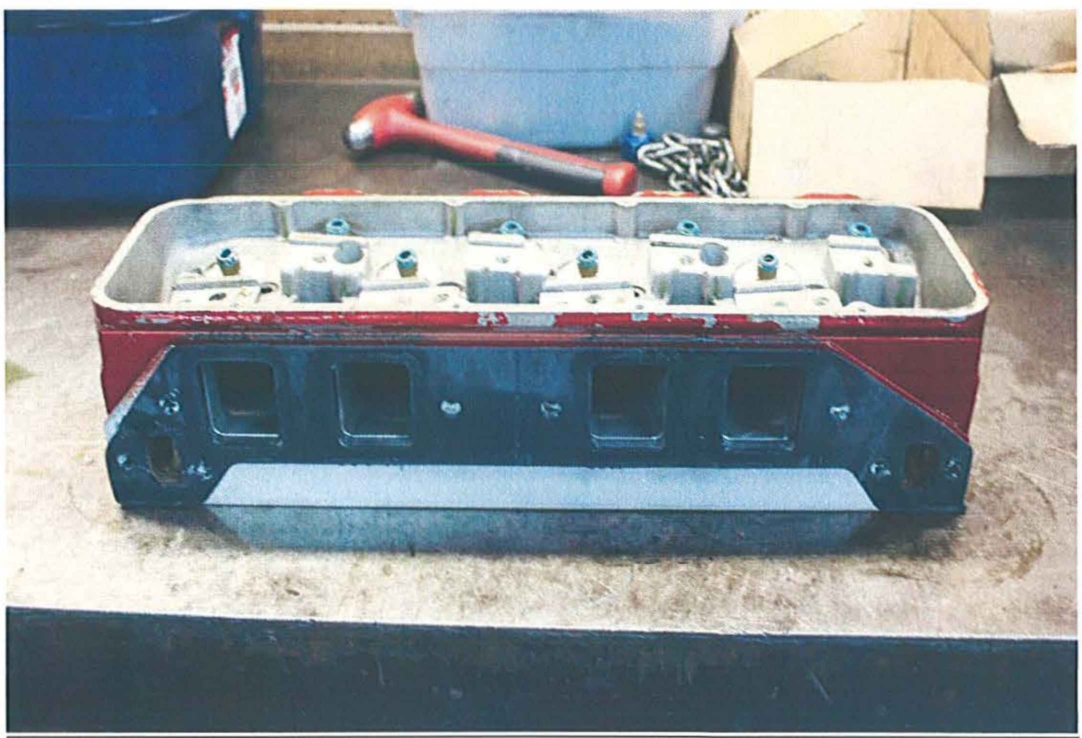

Figure B12 #378R: Cylinder head for cylinders 2,4,6, and 8 valve train side

Figure B13 #378R: Cylinder head for cylinders 2,4,6, and 8 combustion chamber side

Figure B14 #378R: Carbonized buildup adhered to intake valve combustion side (image cropped)

Figure B15 #378R: Carbonized buildup adhered to intake valve combustion side (image cropped)

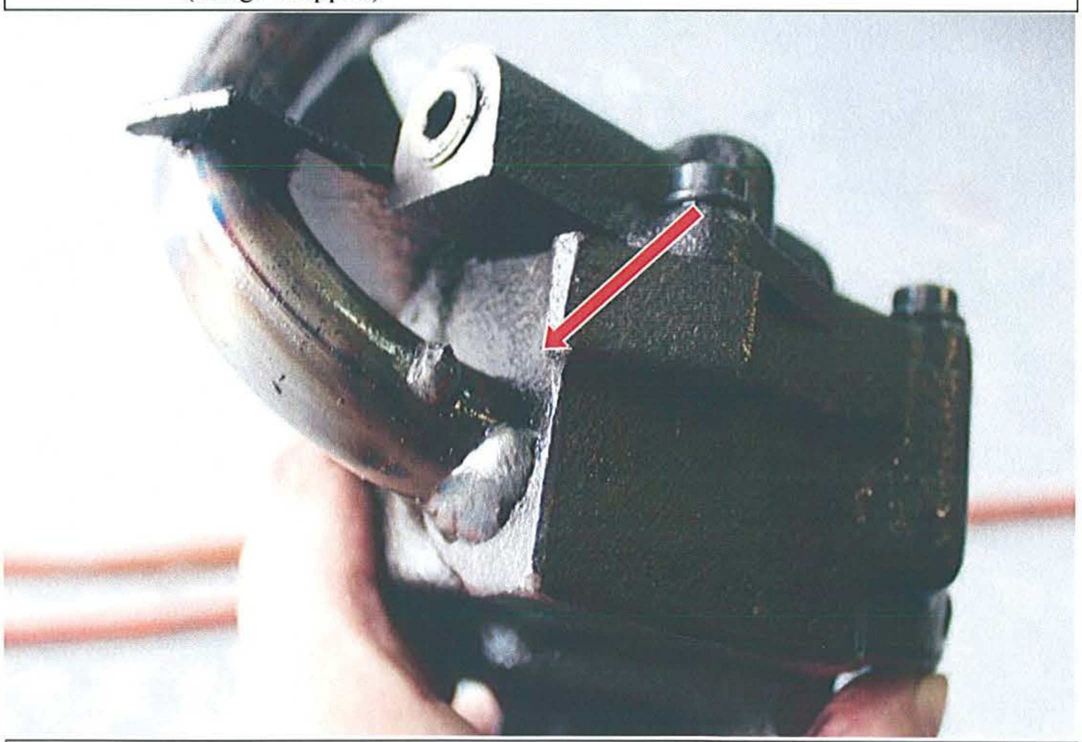

Figure B16 #378R: Oil pump and oil pump pickup tube partially welded interface

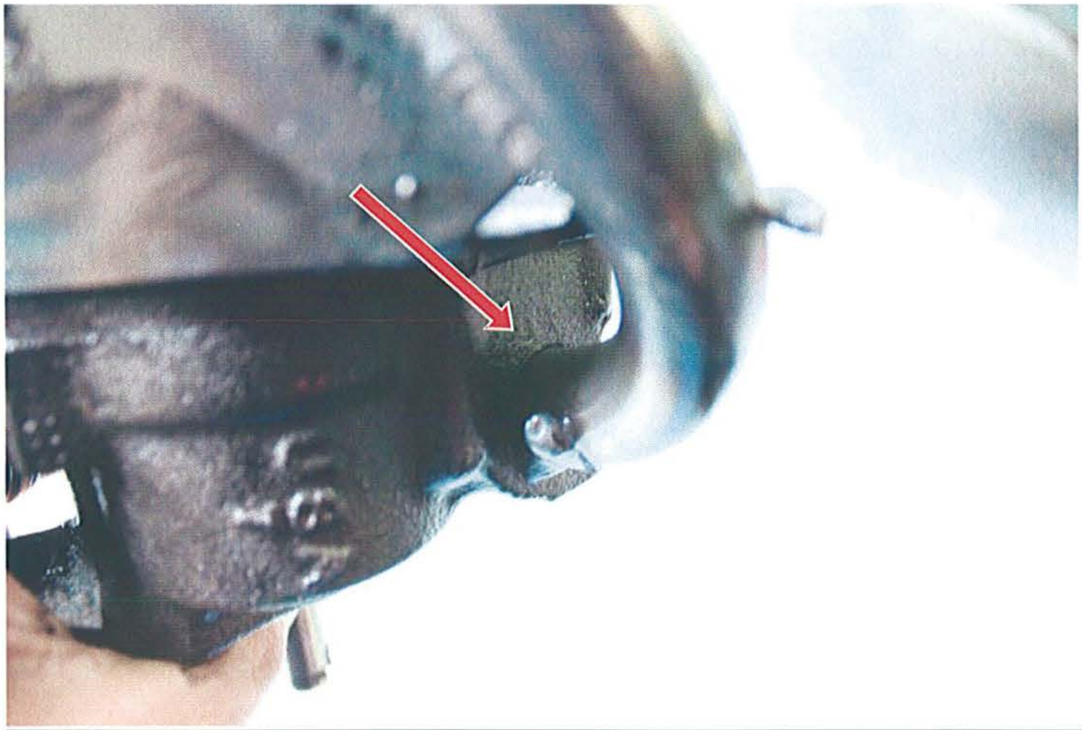

Figure B17 #378R: Oil pump and oil pump pickup tube partially welded interface

Figure B18 #378: Oil sample collected by MER

FIGURES
Photographic Series C
Tests of Oil Pump and Pickup Tube Assembly

Figure C1 Oil pump input shaft leak on #377R as indicated by bubble

Figure C2 Oil pump pickup tube leak on #377R as indicated by bubble

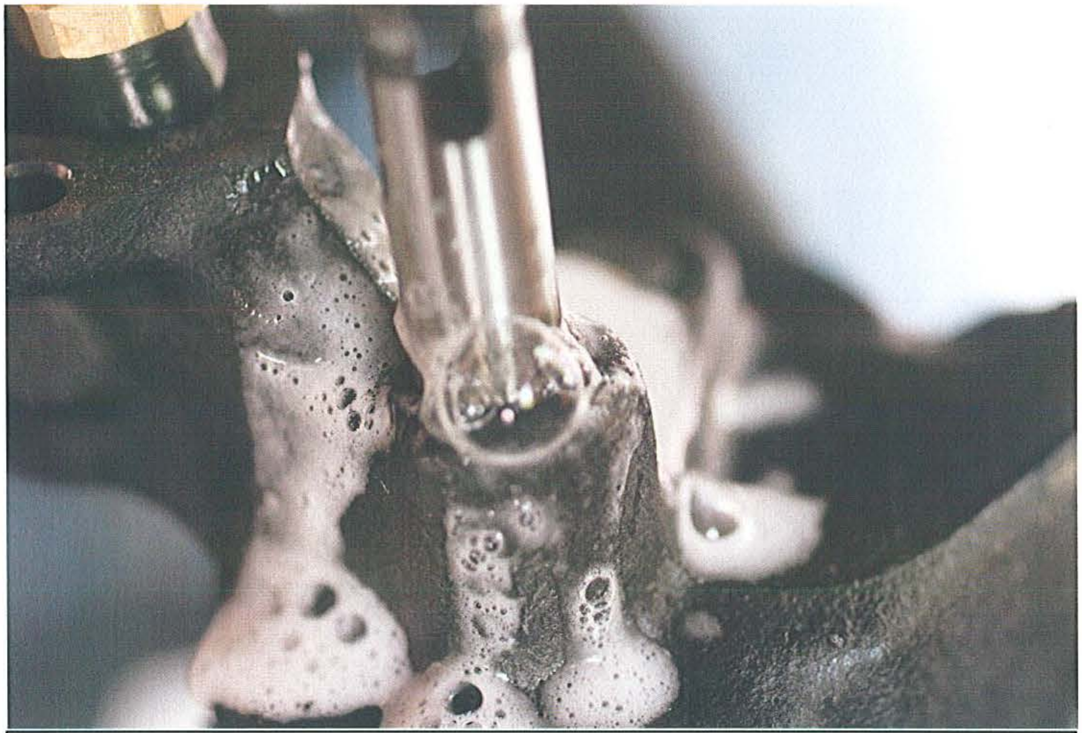

Figure C3 Oil pump input shaft leak on #378R as indicated by bubble

Figure C4 Oil pump pickup tube leak on #377R as indicated by bubble